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HW2 Report

QMBU 450
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Intro:

This report summarizes the Hypothesis and findings done one a data set containing information daily weather summaries taken during WW2 between years 1940 to 1945. The data is obtained from kaggle api, but it originally belongs to the United States National Oceanic and Atmospheric Administration. Original source can be found in this link

Hypothesis:

We shall study the relationship between the daily minimum and maximum temperature (in Celsius) using regression, and see the possibility of predicting the minimum temperature given the maximum temperature.

Method:

The independent variable in this study is the daily maximum temperature given in Celisius. The dependent variable is the minimum daily temperature. A regression function has been implemented in a separate file. The β coefficients have been estimated using the following formula.

$$\hat{\beta} = (X^T X)^{-1} X^T Y$$

Where X is the matrix of the independent variable, and Y is the vector of the dependent variable.

A random sample of 200 points is chosen to run the regression.

Results:

The results demonstrate that there is indeed a linear relation ship between the minimum and maximum daily temperature. Proven by the fact the credible intervals of the estimates do no contain 0. Here are figures of The regression line found for the sample, along with the credible intervals of the estimates:

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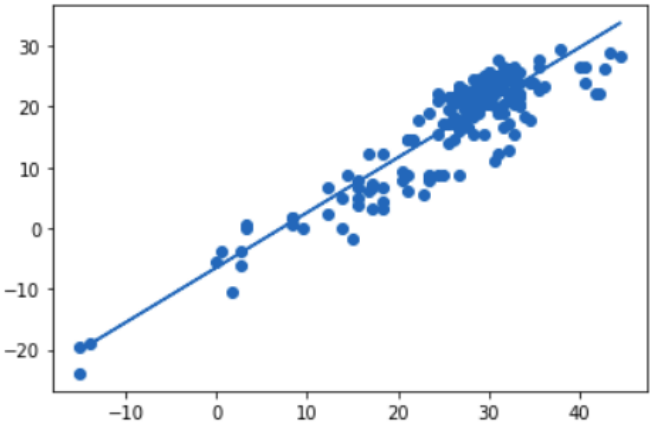

Figure 1: Regression Line

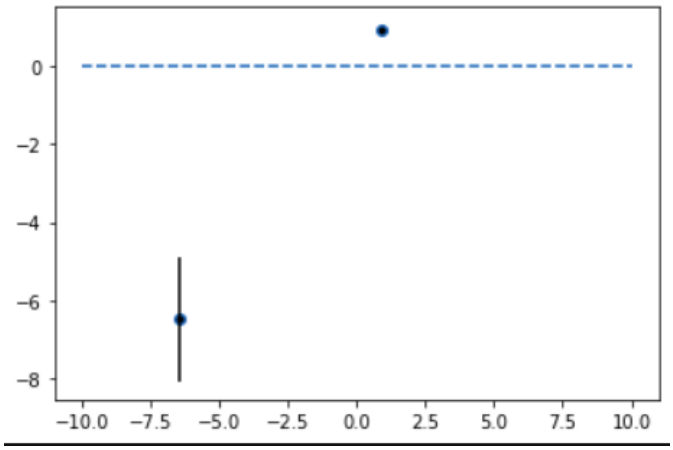

Figure 2: Credible Intervals